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# TEACHER PERCEPTIONS OF SCHOOL CLIMATE AND TWO DIMENSIONS OF MENTAL HEALTH: A CROSS-LAGGED PANEL ANALYSIS

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This study aims to examine the dynamic relationships between school climate, psychological distress, and teacher well-being across two time points. Using a two-wave panel design, the research was conducted among 189 Croatian high school teachers with an approximately 10-month lag. Structural equation modeling was applied to analyse the cross-lagged relationships between the study variables over time. The analyses indicated that, among the structural specifications, the causal model was the most parsimonious. Teachers with better perceptions of the school climate at Time 1 had fewer psychological distress symptoms at Time 2, but the reciprocal effect of well-being and distress was not confirmed. These findings underscore the importance of the school environment as a key factor in shaping teacher experiences rather than focusing solely on individual attributes and support systemic investments in positive school climate.

Keywords: teacher well-being, teacher mental health, psychological distress, school climate, high-school



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## **INTRODUCTION**

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The mental health of teachers, encompassing both psychological distress and personal well-being, has become a critical area of concern in educational research and policy. Alongside increasing rates of stress, anxiety, and emotional exhaustion (Madigan & Kim, 2021; Agyapong et al., 2022), researchers have turned their attention to the positive dimensions of teacher functioning, including life satisfaction, motivation, and psychological growth (Hascher & Waber, 2021; Ryan & Deci, 2001; Seligman, 2011). These personal factors do not operate in isolation; they are deeply embedded in the broader school context, particularly teachers' perceptions of school climate: the relational, emotional, and organisational quality of their work environment (Thapa et al., 2013; Wang & Degol, 2016, González et al., 2023). Hascher & Waber's (2021) review showed that teacher well-being research often falls into deficit-based versus flourishing-based traditions, while Ozturk et al. (2024) propose an integrative framework explicitly distinguishing negative symptoms (e.g., stress, anxiety) from positive states (e.g., satisfaction, growth). In this paper, we therefore conceptualise well-being and distress as two related but separable aspects of teacher mental health, which is in line with increasing consensus that well-being and distress are not simply opposing ends of a single continuum. Distress captures negative symptoms such as stress, anxiety, and depression, while well-being captures positive indicators such as vitality, engagement, and professional growth (Hascher & Waber, 2021; Ozturk et al., 2024). Keyes' (2005) dual-continua model explains how distress does not equal low well-being, and that individuals can be flourishing (high well-being, low distress), struggling (high well-being, high distress), languishing (low well-being, low distress), or mentally ill (low well-being, high distress). We adopt this approach, viewing psychological distress and personal well-being as complementary dimensions of mental health that may be differentially associated with the school context, allowing for a more nuanced understanding of how teachers' mental health relates to their professional experiences and roles (Collie & Martin, 2023; Hascher & Waber, 2021).

### **Psychological distress**

Psychological distress is commonly conceptualised as a multi-dimensional construct encompassing symptoms of depression, anxiety, and stress (Lovibond & Lovibond, 1995), which together represent the most prevalent and overlapping forms of emotional strain in occupational contexts (Agyapong et al., 2022). Research indicates that high levels of stress and burnout among educators affect their mental health and contri-

bute significantly to their intentions to leave the profession (Madigan & Kim, 2021). Agyapong et al. (2022) report wide-ranging prevalence rates of clinically significant symptoms of work-related stress (8.3%–87.1%), anxiety (38%–41.2%), and depression (4%–77%) among teachers. Stress not only affects teachers' health but also undermines their relationships with students and colleagues (Kidger et al., 2016) and is a major factor in teacher attrition (Reinke et al., 2025). These issues have intensified in recent years due to modern societal demands, economic pressures, and the lingering effects of the COVID-19 pandemic (Baker et al., 2021; Santiago et al., 2023). Agyapong et al. (2022) also reported that correlates of stress, burnout, anxiety, and depression include sex, age, marital status, and school-related factors such as years of teaching, class size, job satisfaction, and subject taught.

## Well-being

Well-being is on a general level conceptualised through both hedonic (positive emotions, life satisfaction) and eudaimonic (meaning, growth, purpose) frameworks (Ryan & Deci, 2001), as well as a low level of negative affect (Diener et al., 1999). When we turn to teachers, Hascher and Waber (2021) conducted a systematic review of studies on teacher well-being published between 2000 and 2019, revealing that the field is marked by pervasive ambiguity and heterogeneity of how teacher well-being is defined and theoretically modelled. Authors highlight the importance of both personal resources (e.g., self-efficacy, emotional regulation) and contextual factors (e.g., school climate, workload). Collie and Martin (2023) proposed a tripartite model of teacher well-being comprising subjective vitality (feeling energised at work), behavioural engagement (active involvement in teaching tasks), and professional growth (reflection and investment in development). Drawing on the definition by Huppert and So (2013), well-being as feeling good and functioning effectively, these three components capture both affective and functional dimensions of occupational well-being. In our study, we operationalise well-being as positive mental health, strength, good sense of personal emotional state and functionality.

Well-being of teachers shapes instructional practices, emotional expression, and motivation (Buonomo et al., 2019; Buric & Frenzel, 2021), and is linked with job performance, classroom behaviour, and school-wide effectiveness (Gray et al., 2017; Bajorek et al., 2014). Zhou et al. (2024), in a meta-analysis of factors associated with teacher well-being, identified hope, self-driven motivation, psychological capital, and job competencies as strong positive predictors, while neuroticism and lack of engagement were the most common negative predictors.

A recent integrative framework proposed by Ozturk et al. (2024) argues that much of the existing literature conceptualises teacher well-being through fragmented and one-sided discourses, limiting the development of a more holistic and balanced understanding. Ozturk et al. (2024) synthesise professionalism, deficit-based and positive psychology perspectives, suggesting a unified model of teacher well-being comprising three interrelated dimensions: (a) deficit/negativity (stress, anxiety, depression), (b) flourishing/positivity (job satisfaction, hope, optimism), and (c) professionalism (recognition, peer support, workload).

## School climate

Crucially, school climate has emerged as a key environmental determinant of both psychological distress and well-being. School climate refers to teachers' perceptions of relational and organisational support, leadership quality, collegial trust, and emotional safety (Thapa et al., 2013; Wang & Degol, 2016; Velki et al., 2014). The González et al. (2023) review offers a comprehensive theoretical grounding for the study of school climate, highlighting that school climate is a multidimensional construct encompassing relational, instructional, and organisational dimensions. The authors emphasise that it is closely tied to students' and teachers' emotional and psychological functioning, supporting models such as the ecological systems theory (Bronfenbrenner, 1979) and the Job Demands–Resources (JD-R) model. Numerous studies confirm that positive school climate including warm relational context and collegial support fulfils teachers' basic psychological needs – autonomy, competence, and relatedness thereby enhancing their well-being and reducing emotional strain (Collie et al., 2012; Harrison et al., 2025; Hascher & Waber, 2021). Taken together, these studies reinforce the idea that a supportive school climate is not only protective against distress but also actively cultivates teacher flourishing.

## Interconnectedness of school climate, well-being and psychological distress

In a three-wave longitudinal cohort of early-career teachers conducted by McLean and colleagues (2017), multilevel growth models showed that depressive and anxiety symptoms rose over time. Teachers who perceived a lower-quality school climate experienced significantly steeper increases in depressive and anxiety symptoms across the transition from training to first teaching year. These climate effects were estimated while adjusting for perceived social support and stressful life events, indicating that school climate contributed unique explanatory power beyond outside stressors. Furthermore, Kidger et al.

(2016) found that poor teacher well-being and depression were closely related to several workplace factors, including job dissatisfaction, stress, reduced student attendance, and challenges in seeking collegial support despite wanting it. They also noted that governmental pressures on school ratings contributed to lower well-being. These results reflect how teachers' mental health is not only shaped by individual experiences but also by the broader policies and school climate. Dreer (2022) has also reported upon a time-lagged study of German teachers where school climate and job crafting were modelled as separate predictors, each uniquely forecasting teacher well-being at follow-up. Roffey (2012) in her conceptual paper emphasised that positive school climate and supportive relationships benefit the entire school community. When teachers feel comfortable and supported, especially in environments that promote autonomy and engagement, they are more likely to interact in a caring, respectful way, which improves their interactions with both colleagues and students and in the long run, enhances teachers' psychological functioning and their overall mental health. That is the reason we were interested in bidirectionality, i.e., dynamics over time. Data collection waves were separated by approximately 10 months. To minimise seasonal variation in workload and school routines, both waves were scheduled during the same period of the school year across consecutive years (i.e., the same calendar months). This design allows us to examine prospective associations while reducing potential confounding from the autumn–spring shift in instructional demands and work-related stress.

## **The role of professional experience**

Another important factor to consider is the role of professional experience. While some studies indicate that early-career teachers are more optimistic and report higher satisfaction with their school environment (Admiraal & Røberg, 2023), other studies suggest that novice teachers face greater emotional challenges and instability (Hascher & Waber, 2021). Amitai & Van Houtte (2022) argue that newcomers in the profession face job insecurity and excessive workload, whereas experienced teachers often report dissatisfaction due to limited opportunities for advancement and professional growth. These conflicting findings highlight the need for more research to better understand how career stage may influence the interrelations among well-being, psychological distress, and perceptions of school climate. Hascher and Waber (2021) as well as Collie and Martin (2023) emphasise the need for longitudinal and integrative research to analyse and better understand how well-being changes over time and which factors are related to more adaptive trajectories.

## PRESENT STUDY

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The aim of this study is to investigate the reciprocal, longitudinal relationships between teachers' perceptions of school climate, psychological distress, and personal well-being. Guided by the dual-continua model of mental health (Keyes, 2005) and the integrated teacher well-being framework of Ozturk et al. (2024), we conceptualise well-being and psychological distress as distinct but related dimensions – allowing for a more comprehensive understanding of teachers' mental health. By modelling well-being and psychological distress simultaneously, we avoid conceptualising them as mere opposites. Instead, consistent with dual continua, we test how the positive and negative dimensions of mental health are uniquely and reciprocally associated with teachers' perceptions of school climate.

We integrate this perspective with the Job Demands–Resources (JD-R) model (Bakker & Demerouti, 2017), framing school climate as both a resource that promotes well-being and a protective factor against distress. At the same time, we consider how teachers' own mental states may influence their perceptions of school climate over time, highlighting possible bidirectional effects. While recent studies suggest such dynamic interactions (e.g., Collie & Martin, 2023), the examination of bidirectional relationships between school climate and both positive and negative outcomes remains an under-researched area. Alamos et al. (2022) and colleagues explored the bidirectional association between school climate, personal accomplishment, and emotional exhaustion. Their findings showed that a positive school climate at the beginning of the school year was significantly associated with higher levels of personal accomplishment and lower levels of emotional exhaustion at the end of the year. Nevertheless, given the lack of research in this area and findings from other studies (e.g., Whitaker et al., 2015), which showed that higher levels of work-related stress were associated with poorer teacher–student relationships, there is a clear need for further research into the mutual associations between the school environment and teachers' psychological outcomes.

Moreover, Hascher & Waber (2021) as well as Ozturk et al. (2024) documented that most studies were cross-sectional, with few longitudinal or intervention designs, underscoring the need for more time-sensitive and dynamic research approaches such as ours. This study adopts a two-wave cross-lagged panel design to examine how contextual (school climate) and individual (well-being, distress, and teacher professional experience) factors interact over time and whether teacher experience impacts changes in school climate, well-being, or distress in the second year. More specifically, we hypothesise:

### H1: Stability and Concurrent Relations Over Time

H1a: Teachers' well-being, psychological distress, and perceptions of school climate will show significant stability from Year 1 to Year 2.

H1b: Within each wave, school climate will be positively associated with well-being and negatively associated with psychological distress; well-being will be negatively associated with latent psychological distress.

### H2: School Climate Predicts Mental Health

H2a: More positive perceptions of school climate in Year 1 will predict higher well-being in Year 2, over and above Year-1 well-being and length of service.

H2b: More positive perceptions of school climate in Year 1 will predict lower psychological distress in Year 2, over and above Year-1 distress and length of service.

### H3: Mental Health Predicts Perceptions of School Climate

H3a: Higher well-being in Year 1 will predict more positive perceptions of school climate in Year 2, controlling for Year-1 climate and length of service.

H3b: Higher psychological distress in Year 1 will predict more negative perceptions of school climate in Year 2, controlling for Year-1 climate and length of service.

### H4: Professional Experience as a Predictor

H4: Length of service will negatively predict perceived school climate in Year 2, after controlling for Year-1 climate (i.e., residual change).

## **MATERIALS AND METHODS**

### **Procedure and participants**

The research was conducted as part of the project: 'Testing the 5C framework of positive youth development: Traditional and digital mobile assessment – P.R.O.T.E.C.T.' funded by the Croatian Science Foundation (UIP-2020-02-2852). The survey was conducted online from February to May 2022 (first wave) and from February to April 2023 (second wave) via the SurveyMonkey platform. School counsellors (usually school psychologist, school pedagogue or social pedagogue in Croatia) were asked to distribute the questionnaire to the teacher council, and interested school personnel completed surveys online during their free time. There were 1,029 participants at Time 1 and 889 participants at Time 2, including teachers, school counsellors and headmasters from 65 high-school settings in five Croatian

cities, Rijeka, Zagreb, Osijek, Split and Varaždin. Cities from different regions of the Republic of Croatia were selected in order to make the sample as representative of Croatia as possible. Unfortunately, participation was not mandatory, so we had a lot of participants taking part in the survey only in Time1 or Time2. Since we were interested in the teacher perspective, we have managed to connect the two-panel data for a total of  $N = 189$  teachers from the total number of participants. The average age of the teachers was  $M_{age} = 44.52$  ( $SD = 10.24$ ). The average number of years working as teachers was  $M_{work} = 14.79$  ( $SD = 10.38$ ) years, with a minimum of less than a year or a year (for 9% of the participants), whereas 4.2% were in the profession for 35 years or more. A total of 23.8% of the teachers in our sample were male, and 76.2% were female (according to the Croatian Bureau of Statistics, 2021, 67.9% of the teachers in Croatian secondary schools are female, and 32.1% are male). A total of 22.2% were teachers in gymnasium programmes, 60.3% were working in four-year vocational schools, and 17.5% were working in three-year vocational schools. With respect to the subject the participants were teaching, 19% were teaching languages, 23% were teaching art, 19.6% were teaching humanities, and 29.1% were teaching specific expert subjects.

Ethical approval for the study was obtained from the Ministry of Science and Education, the National Agency for Education, and the institutional ethics committee (Approval No. 251-74/22-01/2). Participation was confidential and voluntary.

## Measures

All instruments utilised were either developed within Croatia or translated into Croatian. Each underwent validation and internal consistency assessments across multiple preliminary studies.

The *demographic questionnaire* asked participants to report upon the length of service in the teaching profession, their gender, the type of high-school programme they were working in and the subjects they were teaching.

The *Croatian school climate questionnaire* (Velki et al., 2014) for teachers contains 18 items (e.g. *I enjoy working at this school*, *Teachers in this school try to support the students*). The questionnaire contains items that include the sense of belonging and safety at school, the relationship between teachers and students, the atmosphere for learning and parental connection with school and involvement in children's education. The participants assess the items on a Likert-type scale where 1 = strongly disagree and 5 = strongly agree, and the total scores are summed to yield a single composite score. Cronbach's alpha

was  $\alpha = 0.84$  for both time points. The results of the confirmatory factor analysis for the Croatian school climate questionnaire (Velki et al., 2014) with 18 items have shown very poor fit (RMSEA = 0.129; RMSEA confidence interval 0.116–0.143; CFI = 0.68; TLI = 0.65; SRMR = 0.090), and after additional analyses, including exploratory factor analysis, which has indicated three-factor solutions, we have decided to form a facet for school climate that includes 6 items from the Croatian school climate scale (Velki et al., 2014), including items 1 (*This school is a safe place for work*), 3 (*Students of this school trust their teachers*), 6 (*Personnel of my school trusts my professional judgements*), 15 (*I feel that I belong to the school I work in*), 16 (*If needed, I have someone to turn to for advice or help*) and 17 (*Relationships between personnel of my school are respectful and collegial*), which mostly describe that teachers feel secure within the school, perceive student and colleague trust, feel supported and connected to their school. This facet has been included in the confirmatory factor analysis and has shown an excellent fit (Time 1 RMSEA = 0.060; RMSEA confidence interval 0.000–0.125; CFI = 0.98; TLI = 0.97, SRMR = 0.031; Time 2 RMSEA = 0.035; RMSEA confidence interval 0.000–0.063; CFI = 0.99; TLI = 0.98, SRMR = 0.040).

*The Warwick-Edinburgh Mental Wellbeing Scale (WEMWBS*, Tennant et al., 2007) was developed to assess mental well-being in the general population. The 14-item scale features positively phrased statements that encompass both emotional and functional aspects of mental well-being (e.g. *I've been feeling good about myself; I've been interested in new things*). The respondents rated each item via a 5-point Likert scale, and the total scores were summed to yield a single composite score. Cronbach's alpha was  $\alpha = 0.92$  for both time points. With respect to the confirmatory factor analysis for the Warwick-Edinburgh Mental Wellbeing Scale, some modifications were necessary to achieve an appropriate model fit for the one-structure model of well-being. We have allowed correlations of items 6 and 12 as well as correlations of items 4 and 9 and included those in the code. Finally, the indices showed a good fit (Time 1 RMSEA = 0.09; RMSEA confidence interval 0.061–0.111; CFI = 0.93; TLI = 0.91, SRMR = 0.051, Time 2 RMSEA = 0.37; RMSEA confidence interval 0.000–0.061; CFI = 0.93; TLI = 0.90, SRMR = 0.047).

*The Depression Anxiety and Stress Scale (DASS-21)*, developed by Lovibond and Lovibond (1995), is a 21-item self-report instrument designed to measure negative emotional states. The scale is divided into three subscales each containing seven items, that assess depression (e.g. *I couldn't seem to experience any positive feeling at all*), anxiety (e.g. *I was worried about*

situations in which I might panic and make a fool of myself), and stress (e.g. *I found it difficult to relax*). The participants rated how they felt over the past week via a four-point Likert scale ranging from 0 ("did not apply to me at all") to 3 ("applied to me very much, or most of the time"). In this study, we used a total score that represents emotional distress. Cronbach's alpha coefficient in the first timepoint was  $\alpha = 0.80$  for anxiety subscale,  $\alpha = 0.90$  for depression subscale and  $\alpha = 0.91$  for stress subscale. In the second timepoint, anxiety subscale had alpha coefficient  $\alpha = 0.82$ , depression subscale had  $\alpha = 0.87$  and stress subscale  $\alpha = 0.90$ . The results of the confirmatory factor analysis for the depression, anxiety and stress scale (Lovibond & Lovibond, 1995) did not show a good fit for three factors (RMSEA = 0.093; RMSEA confidence interval 0.083-0.104; CFI = 0.87; TLI = 0.85; SRMR = 0.059), but since we do not expect depression, anxiety and stress symptoms to be orthogonal, we conducted exploratory structural equation modelling (ESEM), with oblique rotation. This analysis confirmed a three-factor solution with adequate model fit (Time 1 RMSEA = 0.08; RMSEA confidence interval 0.075-0.099; CFI = 0.90; TLI = 0.89, SRMR = 0.042; Time 2 RMSEA = 0.08; RMSEA confidence interval 0.070-0.094; CFI = 0.92; TLI = 0.88, SRMR = 0.043), given the number of participants.

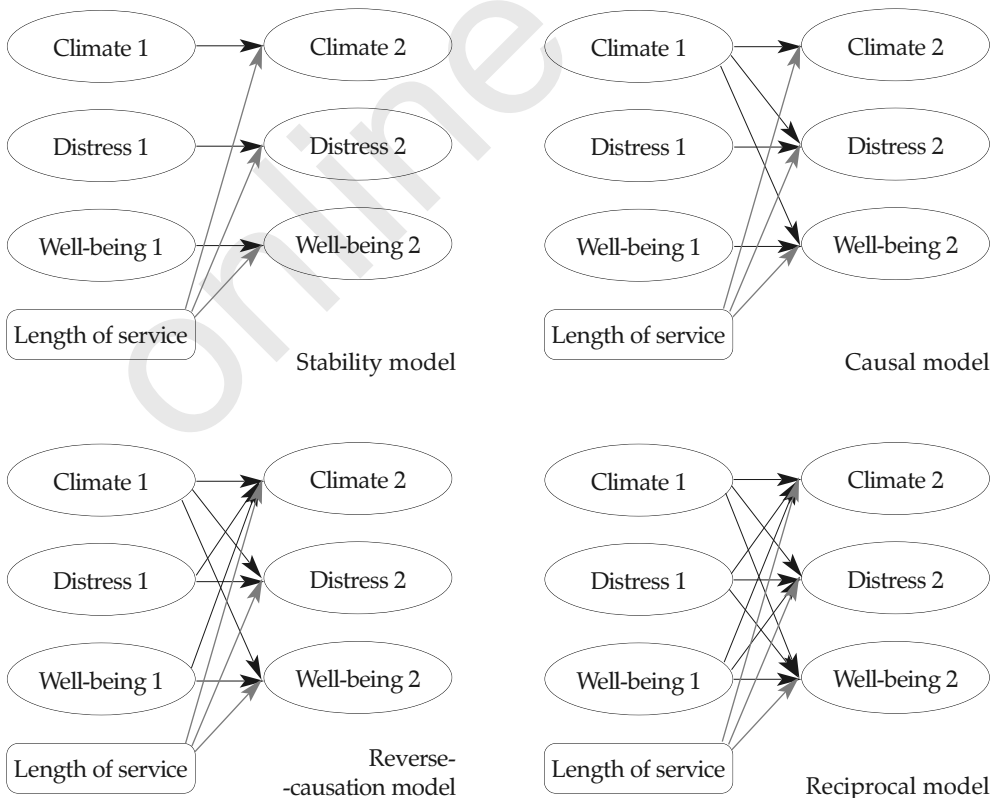
## Statistical analysis

To answer our research questions, the analysis proceeded in multiple stages in the Mplus 8.11 program (Muthén & Muthén, 2019). First, we inspected descriptive statistics and bivariate correlations among school climate, psychological distress, well-being (at both waves), and years of service. Next, measurement invariance testing was conducted, to ensure that the measurement of each construct has not changed across timepoints (Putnick & Bornstein, 2016), which is a prerequisite to structural equation modelling. Although we found school climate facets invariant on both the configural, metric and scalar level, we have encountered invariance difficulties on the distress scale when treated as continuous and have found extremely high SRMR (above 0.253) for the well-being scale. In the next step of invariance testing, we decided to fit item-level ordinal CFAs in Mplus 8.11 (Muthén & Muthén, 2017), using Weighted Least Squares with Mean and Variance adjustment (WLSMV) and the THETA parameterisation. This estimator is appropriate for Likert-type indicators: it models thresholds and polychoric correlations, yields robust mean/variance-adjusted tests (Li, 2016), and enables threshold (scalar) invariance testing for ordinal data while permitting same-item residual correlations across waves (Muthén & Muthén, 2017; Wu & Estabrook, 2016). Model fit was evaluated with comparative fit index (CFI), Tucker-Lewis index (TLI), root-mean-

square error of approximation (RMSEA) with 90% confidence intervals (Hu & Bentler, 1999; Chen, 2007) and standardised root-mean residual (SRMR). Comparison of changes in fit were judged using common criteria (e.g.,  $\Delta CFI \leq 0.010$ ;  $\Delta RMSEA \leq 0.015$ , Chen, 2007).

Finally, the structural equation modelling was employed, and a measurement model was constructed that specified three latent variables – namely school climate, psychological distress and well-being at each time point. The items of each scale served as indicators of their respective latent variables. Length of service was added as a covariate. To address the hypotheses, we estimated four latent cross-lagged models that retained the established measurement constraints: (1) a stability model with only autoregressive paths; (2) a causal (climate-driven) model adding school climate  $\rightarrow$  well-being/distress; (3) a reverse-causation model adding well-being/distress  $\rightarrow$  school climate; and (4) a reciprocal model including both directions. All four tested models are shown in Figure 1. Given the use of WLSMV for ordinal indicators, nested model comparisons relied on the DIFFTEST option (Muthén & Muthén, 2017), and we additionally evaluated  $\Delta CFI$  and  $\Delta RMSEA$  to gauge practical fit changes.

FIGURE 1  
Four tested cross-lagged models



## RESULTS

### Descriptive analysis – stability and concurrent associations

The descriptive statistics and mean differences calculated for all the study variables across the two time points are shown in Table 1. The mean values for school climate, well-being, and emotional distress remained relatively stable over time, with minor fluctuations.

	First wave				Second wave				<i>t</i> test
	<i>N</i>	<i>M</i>	<i>SD</i>	Skewness	<i>N</i>	<i>M</i>	<i>SD</i>	Skewness	
School climate	188	20.64	2.75	-0.75	188	20.21	2.96	-0.73	2.78**
Psychological distress	185	7.16	8.41	1.54	186	6.25	7.72	1.85	1.57
Well-being	185	54.26	7.43	-0.45	185	54.05	7.58	-0.79	0.43
Length of service	189	14.79	10.38	0.46					

\*\* $p < 0.01$

**TABLE 1**  
Descriptive statistics of teacher perceptions of school climate, psychological distress and well-being at Time 1 and Time 2

The school climate showed a slight but significant decrease in the second wave, which was probably due to the return to school during the pandemic and more teaching and classroom management demands, since the first data collection was in 2022 and the second during 2023. Well-being remained nearly unchanged during both timepoints. Psychological distress showed a small decline over time. Standard deviations indicated some variability among participants for most variables. However, substantial variability was found in psychological distress, ranging from no distress to clinically significant levels of experienced distress. The skewness values were within acceptable ranges, indicating approximately normal distributions, except for distress, which showed positive skewness, suggesting a concentration of lower distress scores, which is also expected since we assume that the teachers were overall healthy functioning individuals. Overall, as proposed in our hypothesis H1a, these results suggest stability and consistency in teachers' perceptions of school climate and well-being over time, with a slight reduction in psychological distress in the second wave.

The correlations between all the variables and from both waves are shown in Table 2 and as can be seen, the correlations are in line with hypothesised relations.

The correlation analysis revealed mostly consistent relationships between school climate, psychological distress, well-being, and length of service across the two time points. The school climate was positively associated with well-being and negatively related to distress. A strong inverse relationship was found between psychological distress and well-being, indicating that higher distress levels correspond to lower well-

-being among teachers. Length of service showed weak correlations with other variables, but a small significant negative correlation with the school climate in the first wave suggested that more experienced teachers may perceive the school climate less favourably.

➔ TABLE 2  
Correlations of school climate, psychological distress, well-being and length of service of included teacher sample in Time 1 and Time 2

	1	2	3	4
1 School climate	0.74**	-0.20**	0.47**	-0.07
2 Psychological distress	-0.30**	0.47**	-0.60**	-0.04
3 Well-being	0.50**	-0.49**	0.65**	-0.12
4 Length of service	-0.18*	-0.07	-0.10	1

*Note.* Correlations above the diagonal line represent correlations from the first wave, and correlations below the diagonal line represent correlations from the second wave. On diagonal = T1-T2 (stability) correlations for the same variable. \*\* $p < 0.01$ , \* $p < 0.05$

The association between school climate and psychological distress was stronger at Time 2 ( $r = -0.30, p < 0.01$ ) than at Time 1 ( $r = -0.20, p < 0.01$ ). Similarly, the positive relation between school climate and well-being increased slightly from Time 1 ( $r = 0.47, p < 0.01$ ) to Time 2 ( $r = 0.50, p < 0.01$ ). Psychological distress and well-being were strongly negatively correlated at Time 1 waves (T1:  $r = -0.60, p < 0.01$ ; T2:  $r = -0.49, p < 0.01$ ). Stability correlations across the two waves indicated moderate to high consistency for each construct (ranging from  $r = 0.47$  to  $r = 0.74$ ), where stability coefficient for psychological distress was moderate ( $r = 0.47, p < 0.01$ ), indicating notable variability over time compared to the higher stability of school climate ( $r = 0.74$ ) and well-being ( $r = 0.65$ ). Stability coefficients further showed that school climate and well-being were relatively consistent across waves, whereas psychological distress was more variable, highlighting its sensitivity to situational influences; this pattern suggests that distress may be more amenable to change, and therefore a key target for interventions aimed at improving teacher well-being. The changing correlations across waves suggest that the relationships among school climate, well-being, and psychological distress are not fixed but evolve over time. This could be due to contextual factors related to workplace conditions (e.g., new policies, leadership, or stressors), different sensitivity of constructs (e.g. constructs like distress could be more responsive to environmental changes than others – like perceptions of climate, or due to problems with measurement invariance). This is why we tested measurement invariance in the next paragraph.

## Measurement invariance across time

The results for configural, metric and scalar model invariance are presented in Table 3. We first fit a configural longitudinal CFA in Mplus 8.11 with WLSMV and the THETA parameterisation, treating all indicators as ordinal. The model specified three latent factors (school climate, well-being, distress) at each wave, with items loading on their intended factor and same-item residuals correlated across waves. Model fit was acceptable,  $\chi^2(df) = 3680.889 (3183)$ ,  $p < 0.001$ , CFI = 0.966, TLI = 0.965, RMSEA = 0.029, 90% CI [0.024, 0.033], SRMR = 0.080, supporting the same factor structure at Time 1 and Time 2. Next, we tested metric invariance by constraining factor loadings to equality across waves (marker loadings fixed to 1). Relative to the configural model, overall fit remained adequate,  $\chi^2(df) = 3699.381 (3221)$ ,  $p < 0.001$ , CFI = 0.968, TLI = 0.967, RMSEA = 0.028, 90% CI [0.023, 0.032], SRMR = 0.082. A DIFFTEST comparison which is appropriate for WLSMV indicated that imposing equal loadings did not significantly worsen fit,  $\Delta\chi^2(\text{WLSMV}) = 50.771$ ,  $\Delta df = 38$ ,  $p = 0.081$ ; while changes in approximate fit were small ( $\Delta\text{CFI} = 0.002$  and  $\Delta\text{RMSEA} = 0.0001$ ). Thus, metric invariance was supported, placing the latent factors on a common scale across waves.

TABLE 3  
Fit indices of tested invariance models

	$\chi^2$	<i>df</i>	CFI	TLI	RMSEA (90% CI)	DIFFtest $\Delta\chi^2(\text{WLSMV}); \Delta df$
Configural invariance	3680.889*	3183	0.966	0.965	0.029 (0.024-0.033)	
Metric invariance	3699.381*	3221	0.968	0.967	0.028 (0.023-0.032)	50.771; 38
Scalar invariance	4157.834*	3325	0.944	0.944	0.036 (0.033-0.040)	135.807*; 104
Partial scalar invariance	3855.729*	3303	0.963	0.962	0.030 (0.025-0.034)	96.577; 82

\* $p < 0.001$

Finally, we evaluated scalar/threshold invariance for ordinal indicators by constraining item thresholds to equality across waves while retaining equal loadings. Overall fit for the scalar model was  $\chi^2(df) = 4157.834$ ,  $p < 0.001$ , CFI = 0.944, TLI = 0.944, RMSEA = 0.036, 90% CI [0.033, 0.040], SRMR = 0.090. DIFFTEST against the metric model was significant and full scalar (threshold) invariance was not supported,  $\Delta\chi^2(104) = 135.807$ ,  $p < 0.001$ , although  $\Delta\text{RMSEA} = 0.012$  seemed good, indicator  $\Delta\text{CFI} = 0.022$  exceeded recommended cutoffs. Inspection of modification indices and threshold availability showed that several items lacked higher-order thresholds on one wave; freeing those specific thresholds yielded a partial threshold-invariant model

with good fit. When compared to the metric model, DIFFTEST showed nonsignificant  $\Delta\chi^2(104) = 98.235$ ,  $p = 0.078$ , while changes in fit indices were small ( $\Delta\text{RMSEA} = 0.002$ , indicator  $\Delta\text{CFI} = 0.002$ ). We therefore proceeded with partial scalar invariance, which is widely accepted for longitudinal comparisons of relations (Byrne et al., 1989; Putnick & Bornstein, 2016).

### Cross-lagged model: From school climate and psychological distress to well-being and vice versa

The fit indices of the four cross-lagged models as well as the test of differences of competing models is shown in Table 4. Model comparisons were made under the established longitudinal measurement constraints and controlling for autoregressive effects and length of service. Relative to the stability model, adding school-climate  $\rightarrow$  mental-health cross-lags in the causal model improved fit,  $\Delta\chi^2(2) = 7.061$ ,  $p = 0.029$ . In contrast, adding mental-health  $\rightarrow$  school-climate cross-lags in the reverse causation model did not improve fit over stability,  $\Delta\chi^2(2) = 1.649$ ,  $p = 0.438$ . Furthermore, augmenting the climate-driven model with the reverse cross-lags (reciprocal model) did not yield additional improvement,  $\Delta\chi^2(4) = 3.558$ ,  $p = 0.469$ . As an encompassing check, the reciprocal model fits better than the reverse model,  $\Delta\chi^2(4) = 9.912$ ,  $p = 0.042$ .

TABLE 4  
Results of structural modelling and comparison based on DIFFTEST

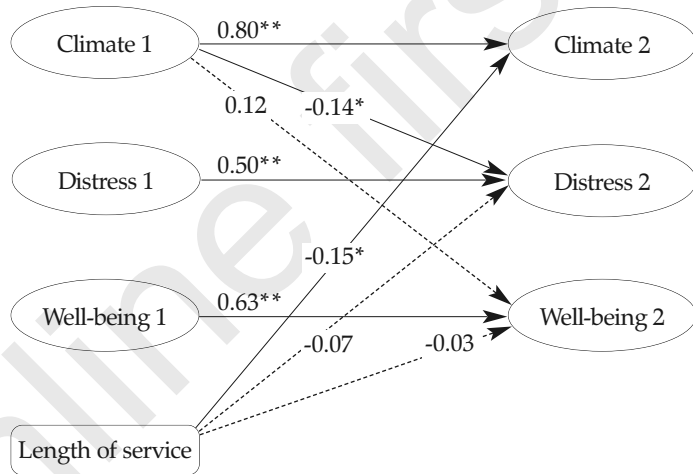
Model	$\chi^2$ (df)	CFI TLI	RMSEA (90% CI)	Model difference	DIFFtest $\Delta\chi^2/df$ (4) (WLSMV); $p$
1 Stability	3816.938 (3303)	0.966 0.965	0.029 (0.024-0.033)		
2 Causal	3804.276 (3301)	0.967 0.966	0.028 (0.024-0.033)	M2 vs M1 sig	7.061; 0.029
3 Reverse- causation	3817.685 (3301)	0.966 0.965	0.029 (0.024-0.033)	M3 vs M1 ns	1.649; 0.438
4 Reciprocal	3807.70 (3297)	0.967 0.966	0.029 (0.024-0.033)	M4 vs M2 ns M4 vs M3 sig	3.558; 0.469 9.912; 0.041

Taken together, the most parsimonious and best-supported specification is the causal, climate-driven model: cross-lagged effects from school climate to subsequent well-being/distress are warranted, whereas the reverse direction is not. The supported model with estimates is shown in Figure 2.

In the climate-driven crossed lagged model (estimated with WLSMV under longitudinal metric and partial threshold invariance), autoregressive stability was high for school climate ( $\beta = 0.80$ ,  $\text{SE} = 0.04$ ,  $p < 0.001$ ), well-being ( $\beta = 0.63$ ,  $\text{SE} = 0.07$ ,  $p < 0.001$ ), and distress ( $\beta = 0.50$ ,  $\text{SE} = 0.07$ ,  $p < 0.001$ ). Controlling for prior length of service, higher school climate at

Time 1 predicted lower psychological distress at Time 2 ( $\beta = -0.14$ ,  $SE = 0.07$ ,  $p = 0.034$ ). The path from school climate at Time 1 to well-being at Time 2 was positive but nonsignificant ( $\beta = 0.12$ ,  $SE = 0.07$ ,  $p = 0.083$ ). Length of service predicted less favourable school climate perceptions at Time 2 ( $\beta = -0.15$ ,  $SE = 0.05$ ,  $p = 0.005$ ), but was not a significant predictor of Time 2 well-being ( $\beta = -0.03$ ,  $SE = 0.05$ ,  $p = 0.523$ ) or distress ( $\beta = -0.07$ ,  $SE = 0.07$ ,  $p = 0.312$ ). Regarding the relationship between school climate and psychological distress and well-being within the same time point, relationships were as expected; climate was positively associated with well-being ( $r = 0.549$ ,  $p < 0.01$  at Time 1;  $r = 0.434$ ,  $p < 0.01$  at Time 2) and negatively associated with distress ( $r = -0.229$ ,  $p < 0.001$  at Time 1;  $r = -0.333$ ,  $p < 0.001$ ; at Time 2), which again confirms our first hypothesis of concurrent associations.

FIGURE 2  
Cross-lagged model  
confirming the path  
from school climate to  
psychological distress  
of teachers



Caption: Standardised paths (STDYX) from the climate-driven CLPM. Paths are estimated controlling for prior levels and length of service; same-item residuals correlated across waves. Solid =  $p < 0.05$ ; dashed = ns.

## DISCUSSION

The aim of this paper was to examine the cross-lagged relationships among school climate, teacher well-being, and psychological distress over time, i.e., a two-wave cross-lagged analysis was applied to test the bidirectional effects of school climate and two related but separable aspects of teachers' mental health. It was hypothesised that a good school climate will predict the mental health of teachers, including lower psychological distress and higher well-being, operationalising mental health as both positive and negative aspects, in line

with the dual model continua (Keyes, 2005). Our results confirmed the hypothesised assumption that lower psychological distress in Time 2 is predicted with a more positive school climate the previous year. This finding is in line with the work of McLean et al. (2017), showing that teachers who perceived a poorer school climate reported a sharper increase in depressive and anxiety symptoms over time, even after accounting for social support and life stressors. However, our assumptions regarding higher well-being at Time 2 were not supported.

In our introduction, we have already mentioned studies that report clinically significant symptoms of internalised disorders and stress in the teacher population (Agyapong et al., 2022; Madigan & Kim, 2021), especially during the Covid-19 pandemic when this study was conducted as well as regarding occupation-related demands. Several Croatian cross-sectional studies such as Brust Nemet and Velki (2020) and Velki and Kuterovac Jagodić (2023) have documented associations between perceived school climate and teacher stress. Brust Nemet and Velki (2020) further noted that elevated stress may bias teachers' perceptions of climate, complicating directional inference. In our two-wave ( $\approx 10$ -month lag) cross-lagged panel, however, more positive school-climate perceptions at Time 1 prospectively predicted lower symptoms of depression, anxiety, and stress at Time 2. By contrast, paths from baseline mental health (well-being and psychological distress) to subsequent school climate were not retained in the best-fitting model; model comparison favoured a causal (climate  $\rightarrow$  symptoms) structure and did not support reciprocal effects. Accordingly, the reverse-direction hypotheses remain open and should be examined in future studies with additional waves and alternative causal designs. Nevertheless, our findings support the idea that investments in better school practices that contribute to management of distress could be beneficial. For example, teacher self-care practices can be integrated into the school climate by promoting regular group activities focused on staff well-being, such as organising healthy lunch gatherings as well as morning or afternoon yoga sessions for teachers and staff (Gray et al., 2017).

Since our findings suggest a positive but nonsignificant association of school climate at Time 1 and well-being at Time 2, this dynamic should be explored in future longitudinal studies with three or more waves. Newer meta-analysis by Zhou et al. (2024) revealed that work climate is a strong positive predictor of teacher well-being. Harrison et al. (2025) examined the relationship between school climate and teacher well-being and reported that school climate impacts teacher well-being both directly and indirectly by fulfilling basic psychological needs, including autonomy, competence develop-

ment, and relatedness. It is plausible to argue that the well-being of teachers could be affected by more extensive life domains and circumstances outside school (e.g., family, parenting, financial burden, leisure, health), but it may be the case that student-teacher relationships which we have not taken into account in this paper are a big factor in the school climate – teacher well-being dynamics. Using a time-lagged model, Dreer (2022) also confirms that teachers reporting a positive school climate experience the greatest well-being. Similarly, Collie and Martin (2023) suggest that relatedness with students functions as a predictor of well-being, which is consistent with the JDR model (Bakker & Demerouti, 2017). However, they suggest that there may also be reciprocal effects, as some well-being dimensions showed associations with changes in relatedness over time. This points to a potentially dynamic, mutually reinforcing relationship between teachers' well-being and their sense of connection with students. Some studies indicate that teachers who report a stronger connection with their students also report greater personal accomplishment and lower emotional exhaustion (Alamos et al., 2022; Corbin et al., 2019). These findings underscore the interconnected nature of the school climate with both teacher and student experiences that has to be further investigated in future studies, emphasising the importance of fostering a supportive and motivating school environment.

Regarding teacher length of service, as hypothesised, our findings revealed that more experienced teachers reported a slightly lower perception of the school climate at Time 2, which could be related to the more positive outlook of teachers at the beginning of their career or more workload on more experienced teachers (Admiraal & Røberg, 2023; Amitai & Van Houtte, 2022). The length of service did not directly predict well-being or distress. This might be due to adaptive coping strategies but also to other factors that may contribute to teachers' overall sense of well-being over time. In their meta-analysis Zhou et al. (2024) note that experienced teachers tend to report just slightly higher levels of various well-being types – hedonic, eudaimonic, occupational, and overall well-being, but with small effect sizes ( $\rho$  ranging approximately from 0.04 to 0.14).

In general, our results indicate that school climate can contribute to diminishing the symptoms of psychological distress, so this finding underscores the importance of the school environment as a systemic factor in shaping teacher experiences rather than focusing solely on individual attributes. Schools should implement interventions that promote collaboration and ongoing professional learning, such as developing a shared school vision on teaching and learning, coaching, peer review,

workshops, and collaborative educational action research (Admiraal & Røberg, 2023). Prior research (Brady & Wilson, 2021) has shown that reactive interventions in school environments, such as mandatory activities for teachers, are often ineffective or even counterproductive, particularly when they impose additional demands on teachers or limit their autonomy. Instead, teachers favour initiatives that address the underlying causes of the problems and policies that promote sustainable workloads over short-term or one-off initiatives.

## Limitations and future research

The self-report method was used in the study. One of the main limitations of the present study is related to the relatively small sample size: although we had more participants in each wave, since the data collection was online and code formation was not controlled, many participants could not be paired and connected at Times 1 and 2. The sample size also affected the strength of our conclusions. The findings obtained should be supported by additional methods, possibly those that could provide information on the intraindividual variability of the variables studied, e.g., the experience sampling method. For better clarity of the effects over time, especially the role of well-being and relationships of school climate and well-being, it would be beneficial to include more time points. This would allow for a more comprehensive assessment of longitudinal trends, providing deeper insights into whether school climate, distress, and well-being influence each other beyond the observed two-year period. Expanding the model also to the student perspective could also help capture potential delayed effects and better distinguish between short-term fluctuations and long-term patterns in terms of teacher well-being and school climate. Future studies should therefore analyse unique contributions of different aspects of school climate to both general and teaching-specific well-being. Since newer reviews highlight burnout and work engagement as the strongest correlates of overall well-being, future designs should also include them when describing teacher well-being.

Finally, a reader must consider different conceptualisations of school climate as well as the conceptualisation of well-being in these studies. In their review, Thapa et al. (2013) highlight five dimensions of school climate: safety, relationships, teaching and learning, the institutional environment, and school improvement. In our study, items related to school climate focused mostly on school relationships. The scale covered feelings of safety, trust, connectedness, and supportive relationships, which is in line with Hascher & Waber (2021), stating that social relationships in school played a key role in teacher well-being, both operationalised as an asset or a risk.

Other studies used different operationalisations of school climate. For example, Dreer (2022) used a five-factor School Level Environment Questionnaire including affiliation, innovation, resource adequacy, participatory decision making, and student support; and Collie and Martin (2023) used only the degree to which teachers feel connected to their students to assess teacher-student relationships. Also, we used a general well-being scale where others used teacher-specific well-being (e.g., Collie and Martin (2023) assess vitality, engagement and professional growth).

## CONCLUSION AND PRACTICAL IMPLICATIONS

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In summary, the results of this two-wave study, with a lag of 10 months, support the relationship between school climate and psychological distress symptoms. Teachers who perceived a better school climate at year one reported lower distress at the second assessment. We have not confirmed the reciprocal effect of well-being or psychological distress. Given that teacher well-being is influenced by national and school policies, a systemic approach ensuring fair workloads, sufficient resources, and supportive leadership is essential (Viac & Fraser, 2020). Additionally, promoting collaboration among colleagues, students, and parents can strengthen professional networks, reduce stress, and improve job satisfaction. Given that an individual's ability to act as an agent of the school climate is limited by organisational, material, and often deeply embedded value and normative systems, school-level policies and early interventions for teachers are crucial for preventing long-term negative effects regarding the symptoms of psychological distress.

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### Data availability statement

The data are available upon reasonable request.

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## Percepcija nastavnika o školskoj klimi i dvije dimenzije mentalnoga zdravlja: analiza križnih panel podataka

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Osijek, Hrvatska

Glavni cilj ove panel-studije koja je provedena u dvije točke bio je ispitati uzajamne odnose školske klime, emocionalne uznemirenosti i dobrobiti učitelja. Istraživanje je provedeno na uzorku od 189 hrvatskih srednjoškolskih nastavnika s

razmakom od približno 10 mjeseci. Kako bi se provjerili odnosi varijabli tijekom vremena, primijenjeno je modeliranje strukturalnim jednadžbama, tj. autoregresijski križni modeli. Analize su pokazale da je od strukturalnih modela najparsimoničniji bio kauzalni model. Nastavnici koji su izvještavali o boljoj školskoj klimi u prvoj vremenskoj točki izvještavali su o manje emocionalne uznemirenosti u drugoj vremenskoj točki. Recipročan efekt psihološkoga distresa i dobrobiti na školsku klimu nije utvrđen. Rezultati naglašavaju važnu ulogu školske klime u predviđanju problema mentalnoga zdravlja nastavnika te dodatno potvrđuju ključnu ulogu školskog okruženja. Kako bi ga se poboljšalo, uz brigu o individualnim karakteristikama učitelja, treba ulagati u sustavno njegovanje pozitivne školske klime.

Ključne riječi: dobrobit nastavnika, mentalno zdravlje nastavnika, emocionalna uznemirenost, školska klima, srednja škola



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